

OFFICE OF DEFENSE PROGRAMS

FY 1995

<u>Office of Defense Programs - Grand Total</u>	\$90,355,000
<u>The Weapons Research, Development and Test Program</u>	\$90,355,000
<u>Sandia National Laboratories</u>	\$42,452,000
<u>Materials Preparation, Synthesis, Deposition, Growth or Forming</u>	\$14,587,000
Environmentally Conscious Manufacturing Technologies	767,000
Microelectronics & Photonics Materials	731,000
Micromechanical Technology	1,822,000
Chemical Processing Science	506,000
Polymer Synthesis, Process & Reliability	1,049,000
Porous & Microporous Materials	1,439,000
Metal Joining Technologies	1,388,000
Smart Processing Of Materials	1,607,000
Materials Science Research Support	276,000
Template-Mediated Ontogenesis:	
A Novel Approach to Mesomorphic Materials	350,000
Dynamics of Nucleation in Chemical Vapor Deposition	367,000
Atomic-Scale Measurement of Liquid Metal Wetting and Flow	364,000
Atomic Layer Epitaxial Growth of Diamond Using Halogenated Gases	397,000
Development of a Scaleable, Flat-Flame Technology for the Synthesis of Diamond Films	384,000
Synthesis and Processing of High Strength SiC Foams: A Radically New Approach to	
Ceramic-Ceramic Composite Materials	365,000
Molecular Adhesion Including Chemical Reactions at Polymer-Solid Interfaces	380,000
Synthesis of Ceramics Using Supercritical Fluids	365,000
Carbon Nanotube Reinforced Composites	396,000
Advanced Materials for Biomedical and Aerospace Applications	217,000
Chemical Functional of Oligosilanes: Economically Attractive Routes to New	
Photoresponsive Materials	393,000
Polyphosphaacetylenes: New Conducting Hybrid Organic-Inorganic Materials	300,000
New Adhesive Systems Based On Functionalized Block Copolymers	228,000
Engineered Monodisperse Porous Materials	321,000
Low-Dielectric and High-temperature Films for Multichip Modules	175,000
<u>Materials Structure and Composition</u>	\$ 1,811,000
Advanced Analytical Methods For Materials Research	1,272,000
Adaptive Scanning Probe Microscopies	417,000
Characterization and Correlation of Physical Properties of	
Ceramics Through Orientation Imaging Microscopy	122,000

OFFICE OF DEFENSE PROGRAMS (Continued)

FY 1995

The Weapons Research, Development and Test Program (continued)Sandia National Laboratories (continued)Materials Properties, Behavior, Characterization or Testing \$19,762,000

Energetic Material Center	106,000
Computational Solid Dynamics	2,716,000
Applied Materials & Mechanics Collaborations	635,000
Development Of More Efficient Power Sources	1,044,000
Basic Science Of Materials Stability	1,829,000
Advanced Materials Characterization Science	1,006,000
Photonics Technology	1,206,000
Electronic Ceramics	899,000
Ultrahard Materials Research	594,000
Impurity Effects On Interfaces	997,000
Materials Aging & Reliability	1,155,000
Engineering Sciences Research	6,157,000
Gas Separation of Fullerene Membranes	300,000
PbO-free Composites for Low Temperature Packaging	359,000
Demonstration of Molecular-Based Transistors	317,000
Nanocomposite Materials Based on Hydrocarbon-Bridged Siloxanes	442,000

Device or Component Fabrication, Behavior or Testing \$ 5,589,000

MC4300 Neutron Tube	329,000
Smartweld II	1,985,000
Manufacturing Technology	1,859,000
Electronic & Microelectromechanical Systems (MEMS) Components	1,416,000

Instrumentation and Facilities \$ 703,000

Materials Processes for Manufacturing	703,000
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Lawrence Livermore National Laboratory \$20,876,000Materials Preparation, Synthesis, Deposition, Growth or Forming \$ 5,245,000

Engineered Nanostructure Laminates	1,800,000
Sol Gel Coatings	335,000
KDP Growth Development	900,000
ICF Capsule Ablators via Plasma Polymerization	500,000
Vicarious Nucleophilic Substitution Chemistry	400,000
CHEETAH Thermochemical Code	190,000
Hard Target Penetrator Explosive	900,000
Injection Moldable Explosives	220,000

*This activity is jointly funded (50:50) by DOE DP and the DoD.

OFFICE OF DEFENSE PROGRAMS (Continued)

FY 1995

The Weapons Research, Development and Test Program (continued)Lawrence Livermore National Laboratory (continued)Materials Properties, Behavior, Characterization or Testing \$ 1,260,000

Interfaces, Adhesion, and Bonding	460,000
Laser Damage: Modeling and Characterization	400,000
KDP Characterization	400,000

Instrumentation and Facilities \$14,371,000

Scanning Tunneling Microscopy (STM) and Atomic Force Microscopy (AFM)	250,000
Treatment of Waste and Water with Carbon Aerogel Electrodes	425,000
Trilayer Josephson Junctions (Technology Transfer Initiative)	375,000
Lithium Cell Development	200,000
Environmentally Safe Disposal of Explosive Wastes: SERDP Project	800,000
Laminated Metal Composites for Aerospace Applications	700,000
Fatigue of Metal Matrix Composites	500,000
Novel Materials for Optoelectronics and Photonics	600,000
Novel Materials Studies at High Pressures and Temperatures	400,000
Materials Produced with Dynamic High Pressure	400,000
Properties of Hydrogen at High Shock Pressures and Temperatures	300,000
Low Density Foam Shells for Cryogenic ICF Experiments	600,000
Atomic Level Explosive Calculations	400,000
Explosive Equation of State	700,000
Metastable Solid-Phase High Energy Density Materials	236,000
Metastable Solid-Phase High Energy Density Materials	535,000
AFM Investigations of Crystal Growth	210,000
Superplastic Forming of Stainless Steel Automotive Components	150,000
Formability and Joining Analysis for Superplastic Panel Design	360,000
Microstructural Evolution in Welds	330,000
Uranium Casting Program	1,000,000
Uranium Spin Forming	1,500,000
Plutonium Near Net Shape Casting	2,500,000
Electron Beam Cold Hearth Melting of Uranium	900,000

Los Alamos National Laboratory \$27,027,000Materials Preparation, Synthesis, Deposition, Growth or Forming \$ 5,055,000

Actinide Processing Development	1,350,000
Plutonium Oxide Reduction	150,000
Low Density Microcellular Plastic Foams	200,000
Physical Vapor Deposition and Surface Analysis	300,000
Chemical Vapor Deposition (CVD) Coatings	150,000
Polymers and Adhesives	430,000
Tritiated Materials	175,000
Salt Fabrication	800,000
Slip Casting of Ceramics	300,000

OFFICE OF DEFENSE PROGRAMS (Continued)

FY 1995

Los Alamos National Laboratory (continued)Materials Preparation, Synthesis, Deposition, Growth or Forming (continued)

Plasma-Flame Spraying Technology	300,000
Rapid Solidification Technology	500,000
Bulk Ceramic Processing	250,000
Synthesis of Ceramic Coatings	150,000

Materials Structure or Composition \$ 1,237,000

Actinide Surface Properties	700,000
Neutron Diffraction of Pu and Pu Alloys and Other Actinides	237,000
Surface, Material and Analytical Studies	300,000

Materials Properties, Behavior, Characterization or Testing \$ 2,500,000

Mechanical Properties of Plutonium and Its Alloys	450,000
Phase Transformations in Pu and Pu Alloys	450,000
Plutonium Shock Deformation	350,000
Non-Destructive Evaluation	550,000
Powder Characterization	50,000
Shock Deformation in Actinide Materials	300,000
Dynamic Mechanical Properties of Weapons Materials	350,000

Device or Component Fabrication, Behavior or Testing \$ 3,900,000

Target Fabrication	1,500,000
Filament Winder	100,000
High Energy Density Welding in Hazardous Environments	800,000
Uranium Scrap Conversion and Recovery	1,500,000

Laboratory Directed Research and Development \$10,802,000

Electronically Correlated Materials at Ambient and Extreme Conditions	328,000
Organometallic Chemical Vapor Deposition	248,000
Polymer Sorbents for Hazardous Metal Uptake	164,000
Microscopic Materials Modeling: Textures and Dynamics	109,000
Surface Modification of Materials	315,000
Integration of Fundamental Knowledge in Plasticity and Textures to Provide Technical Tools for Microscopic Applications	290,000
High Resolution Electron Microscopy of Materials	350,000
Nano-Fabrication	255,000
Thin Film Micro-Electrochemical Sensor Development	210,000
Liquid Crystal Thermosets	200,000
Neutron and Resonant X-ray Scattering by Materials	350,000
Structural and Electronic Competitions in Low-Dimensional Materials	360,000
Fundamental Aspects of Photoelectron Spectroscopy in Highly Correlated Electronic Systems	300,000

OFFICE OF DEFENSE PROGRAMS (Continued)

FY 1994

Los Alamos National Laboratory (continued)Laboratory Directed Research and Development (continued)

Development of High Strength High Conductivity Materials for High Magnetic Field Devices	100,000
Low Temperature STM for Structural and Spectroscopic Studies of High Temperature Superconductors and Other Electronic Materials	50,000
Materials with Fine Microstructures	365,000
Ion Beam Materials Research	330,000
Texture Studies of Highly Deformed Composite Materials	192,000
Pressure Dependency of the Structure of High Explosives: Nitromethane	192,000
Neutron Reflection Studies of Thin Film and Multilayer Structures	300,000
Neutron Reflectivity Studies of In Situ Corrosion of Metal Surfaces	145,000
The Dynamics of Amorphous Materials	330,000
Advanced Material Science Algorithms for Supercomputer Architectures	75,000
Metal Vapor Synthesis in Organometallic Chemistry	235,000
Separation Chemistry of Toxic Metals	250,000
Polymers for Integrated Optical Interconnects	266,000
High Temperature Materials Synthesis Without Heat: Oxide Layer Growth on Electronic Materials Using High Kinetic Energy Atomic Species	164,000
Dynamic Deformation of Advanced Materials	855,000
Strain Measurements in Individual Phases of Multi-Phase Materials	130,000
Artificially Structured Nonlinear Optic and Electro-Optic Materials	465,000
Structural Phase Transitions in Non-Stoichiometric Oxides	275,000
Strongly Correlated Electronic Materials	495,000
Plasma Immersion Ion Implantation for Semiconductor Film Growth	261,000
Analysis of Structure and Orientation of Adsorbed Polymer in Solution Subject to Dynamic Shear Stress	172,000
Development of Pair Distribution Function Analysis of Mesosstructural Details in Single Crystal Perovskites and Nanocrystalline Materials	170,000
Neutron Scattering as a Probe of the Structure of Liquid Crystal Polymer-Reinforced Composite Materials	180,000
Strain Measurements in Individual Phases of Multi-Phased Materials During Thermomechanical Loading: LANSCE Neutron Scattering Experiment Support	318,000
A New Approach to Texture Measurements: ODF Determination by Rietveld Refinement	73,000
Applications of Fullerenes in Nuclear Technology	360,000
Ceramic Oxide Foams for Separation	400,000
Materials Modeling Project	125,000
Synthesis and Optical Characterization of Novel Fullerene-Based Composites	50,000

Technology Transfer Initiative

\$ 3,533,000

A Pilot Program: Chemical Vapor Deposition of Diamond in a Fluidized-Bed for Cutting Tool and Tribological Applications	250,000
Advanced Beryllium Processing	632,000
Automated Pulsed Laser Deposition System	130,000
Plasma Source Ion Implantation for the Automotive Industry	1,326,000
Processing Modeling and Control for U.S. Steel Industry	1,195,000